EMCal Skin, Block and Screen Design

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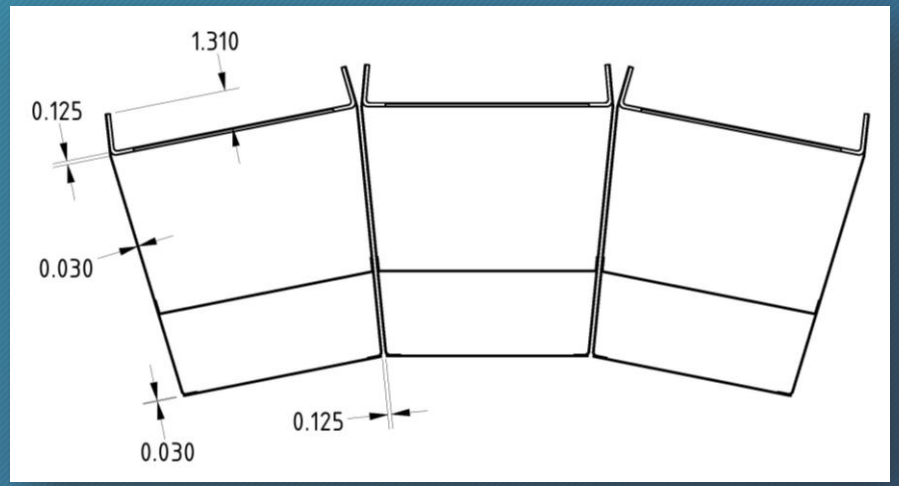
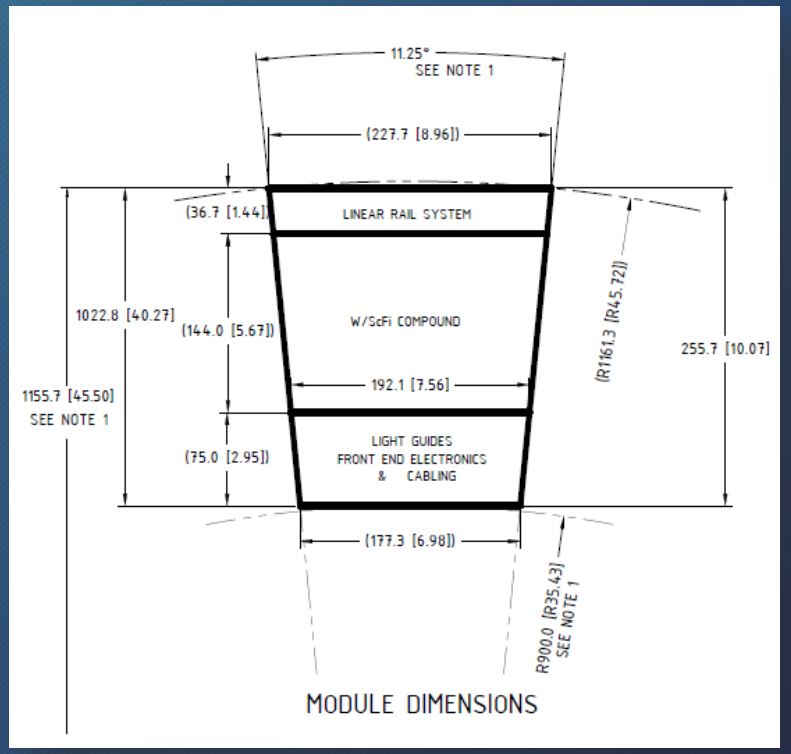
EMCal Tolerances and Gaps

From Each Face to Nominal		Tolerance		Gap
Between Blocks		±0.005 in		0.0075 in
(mm)		±0.127 mm		0.1905 mm
Between Blocks and Skin (in)		N/A		0.0075 in
(mm)		N/A		0.1905 mm
Between Skins (in)		±0.005 in		0.0625in
(mm)		±0.127 mm		1.5875 mm

EMCal Aluminum Skin / Box

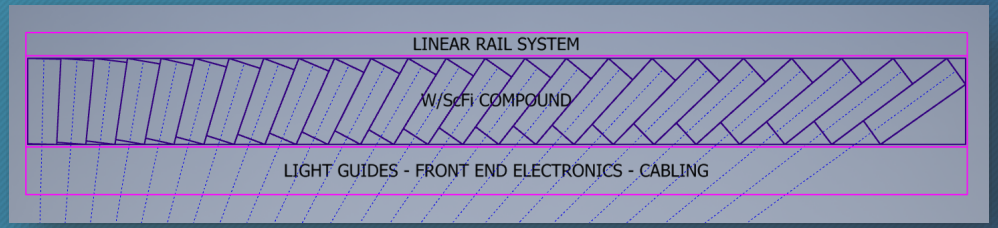
- Side and bottom thickness. 0.03 in (0.76 mm)
- Top thickness. 0.125 in (3.175 mm)
- Rail Hight. Max 1.31 in (33.27 mm)
- Gap between skins. 0.125 in (3.175 mm)

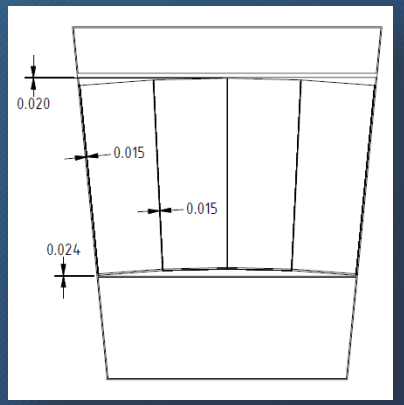




EMCal Blocks

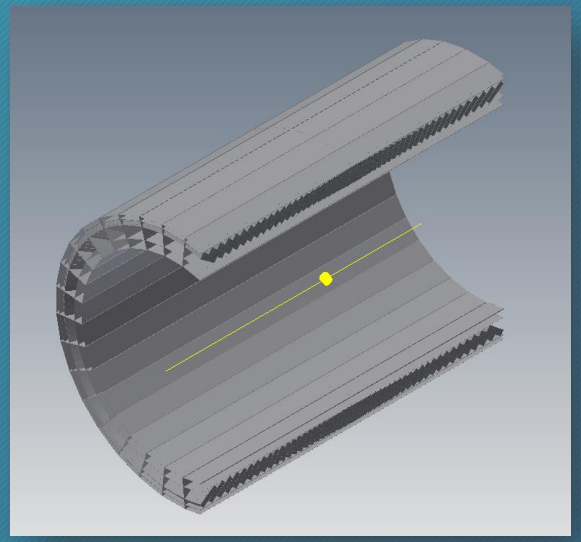
- Constrain the bottom length to have the same value. (Yes?)
- Block tolerance. ±0.01 in (±0.25 mm)
- Gaps between blocks. 0.015 in (0.381 mm)
- Gaps between the skin and the blocks. 0.015 in (0.381 mm)
- Gaps between bottom/top of the blocks. Min ~ 0.02 in (0.51 mm)

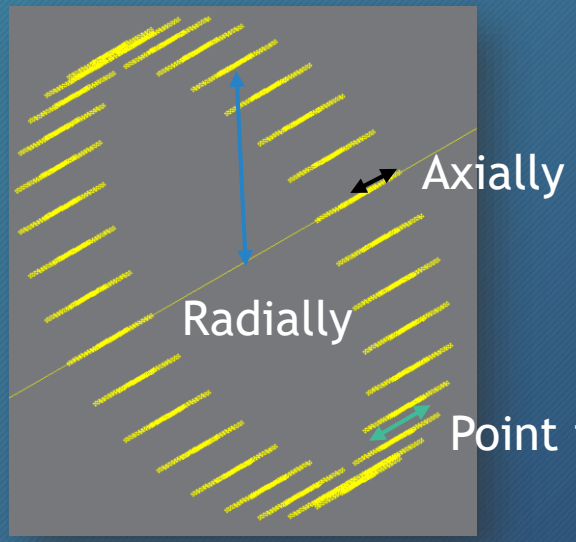


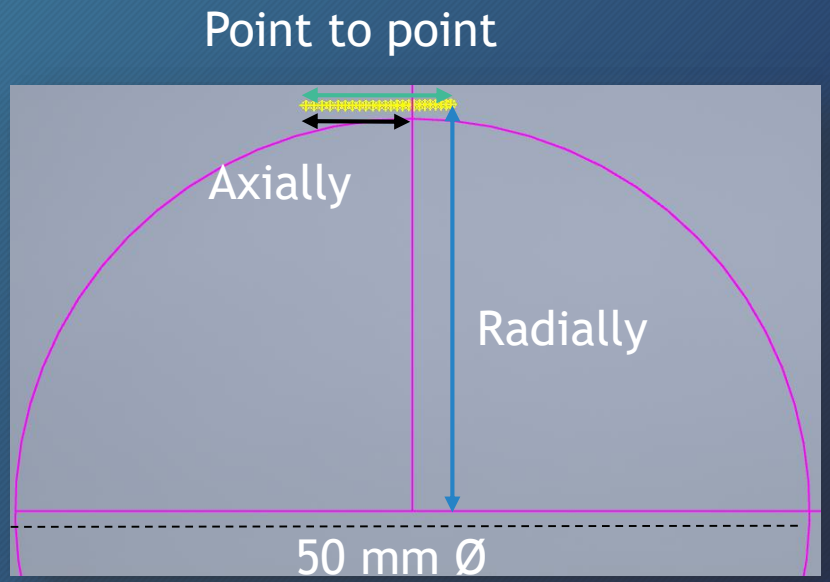


EMCal Modules Focus

- Distance from the center of the EMCal to the focal point of the blocks.
  - Axially. Max ~ 0.27 in (6.86 mm)
  - Point to Point. Max ~ 0.36 in (9.14 mm)
  - Radially. Max ~ 1.02 in (25.91 mm)

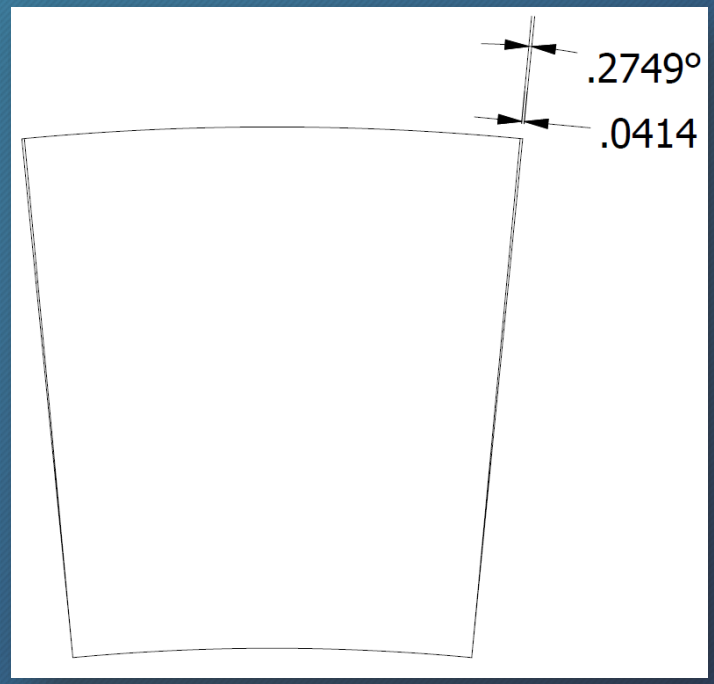






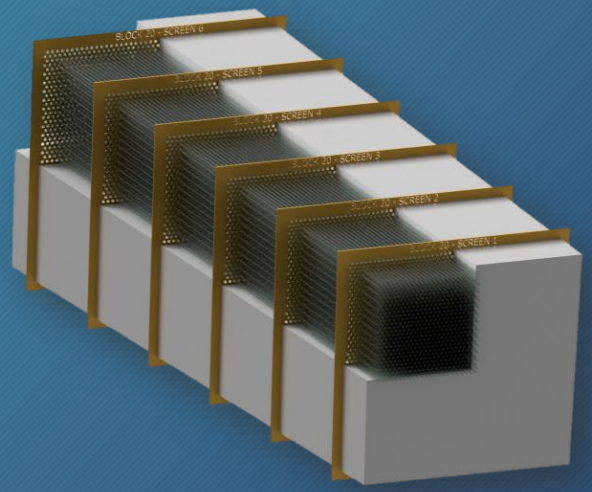
EMCal Modules Focus

- Axially and point to point can be adjusted slightly by changing the geometry of the blocks and no change to the gaps.
- Creating a angled gap between skins, and thus adjusting the block geometry accordingly, would eliminate the radial gap. (0.55 deg.)
- Max gap increase: 0.0414*2 = 0.0828 in (2.1031 mm)

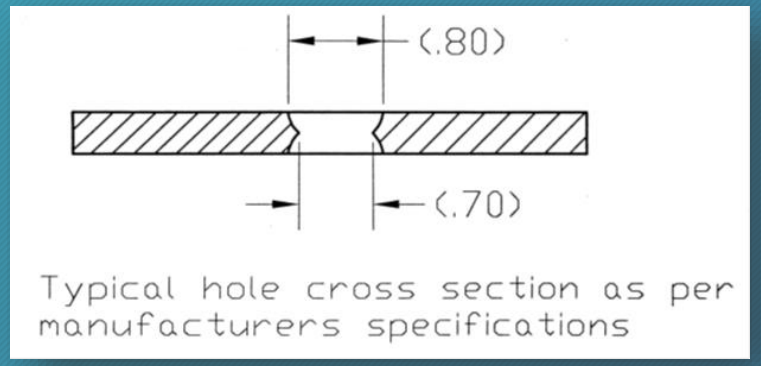


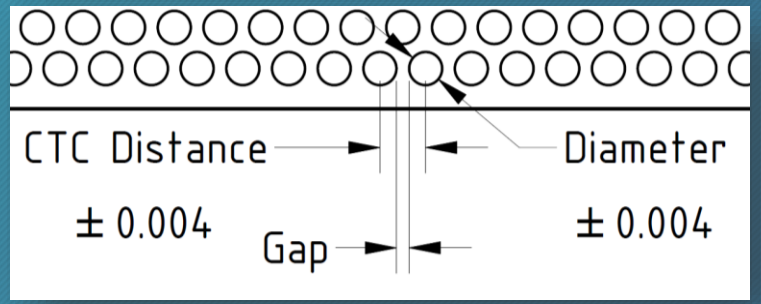
EMCal Screens

- How far into the block should the first/last screen be? (6 mm?)
- Area for the triangles created by the center to center lines within a block constrained to be equal. (Yes?)
- Triangle area compared to the “ideal area” max percent error. (±0.7%).



EMCal Screens





B*H = Number of Fibers:
(CTC-Diameter)-Tolerance
= Gap

47*52 = 2444 Fibers:
(0.9689-0.7)-0.2032
= 0.0657mm or 0.0026”

47*53 = 2491 Fibers:
Same as above.

48*53 = 2544 Fibers:
(0.9485-0.7)-0.2032
= 0.0453 mm or 0.0018”

48*54 = 2592 Fibers:
Same as above.

49*54 = 2646 Fibers:
(0.9290-0.7)-0.2032
= 0.0258 mm or 0.0010”

49*55 = 2695 Fibers:
Same as above.

49*56 = 2744 Fibers:
Same as above.

50*56 = 2800 Fibers:
(0.9102-0.7)-0.2032
= 0.007mm or 0.0003”

51*56 = 2856 Fibers:
(0.8922-0.7)-0.2032
= Negative

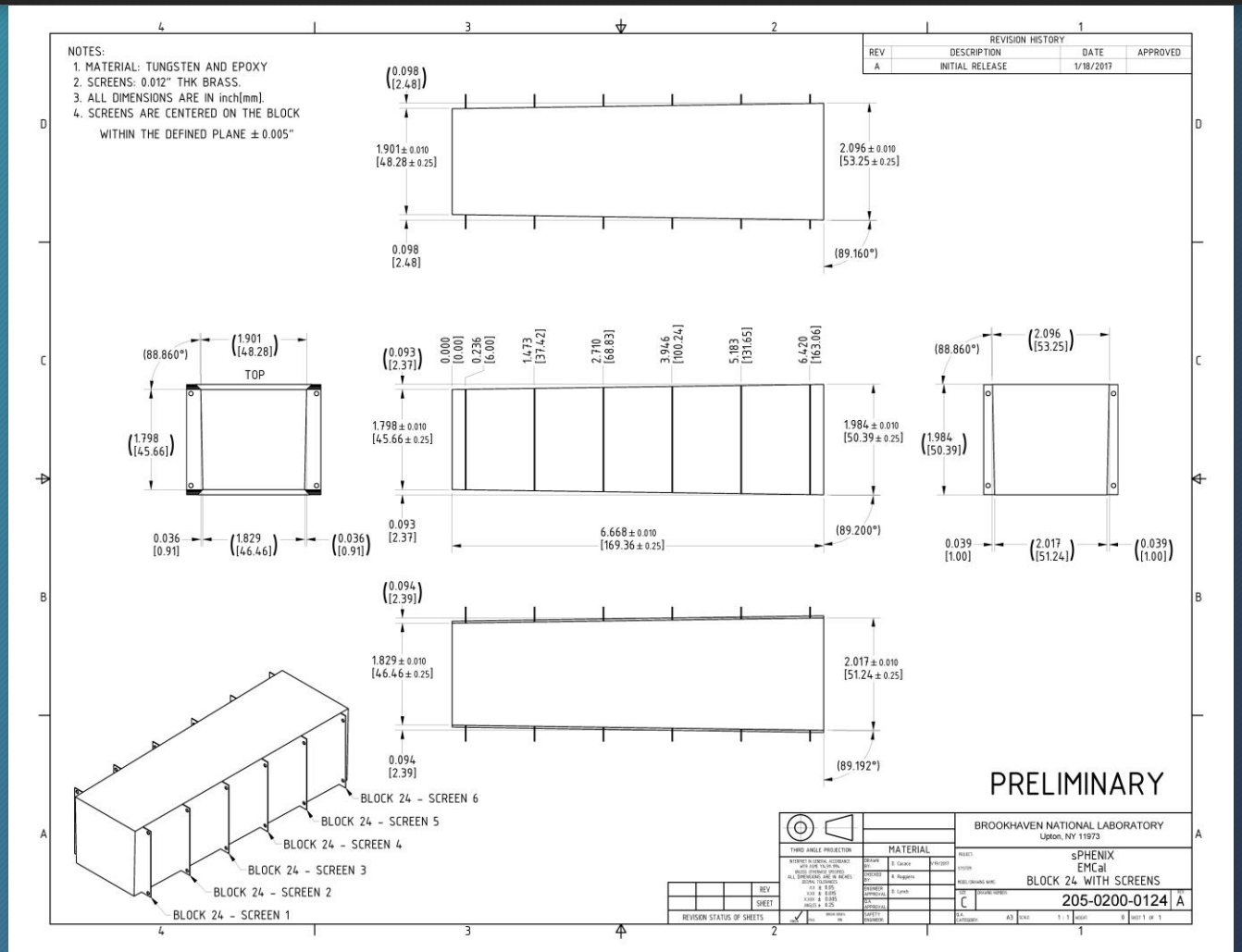
47*53 = 2491 Fibers:
(0.038-0.0.28)-0.008
= 0.002” or 0.0508 mm

48*54 = 2592 Fibers:
(0.037-0.0.28)-0.008
= 0.001” or 0.0254 mm

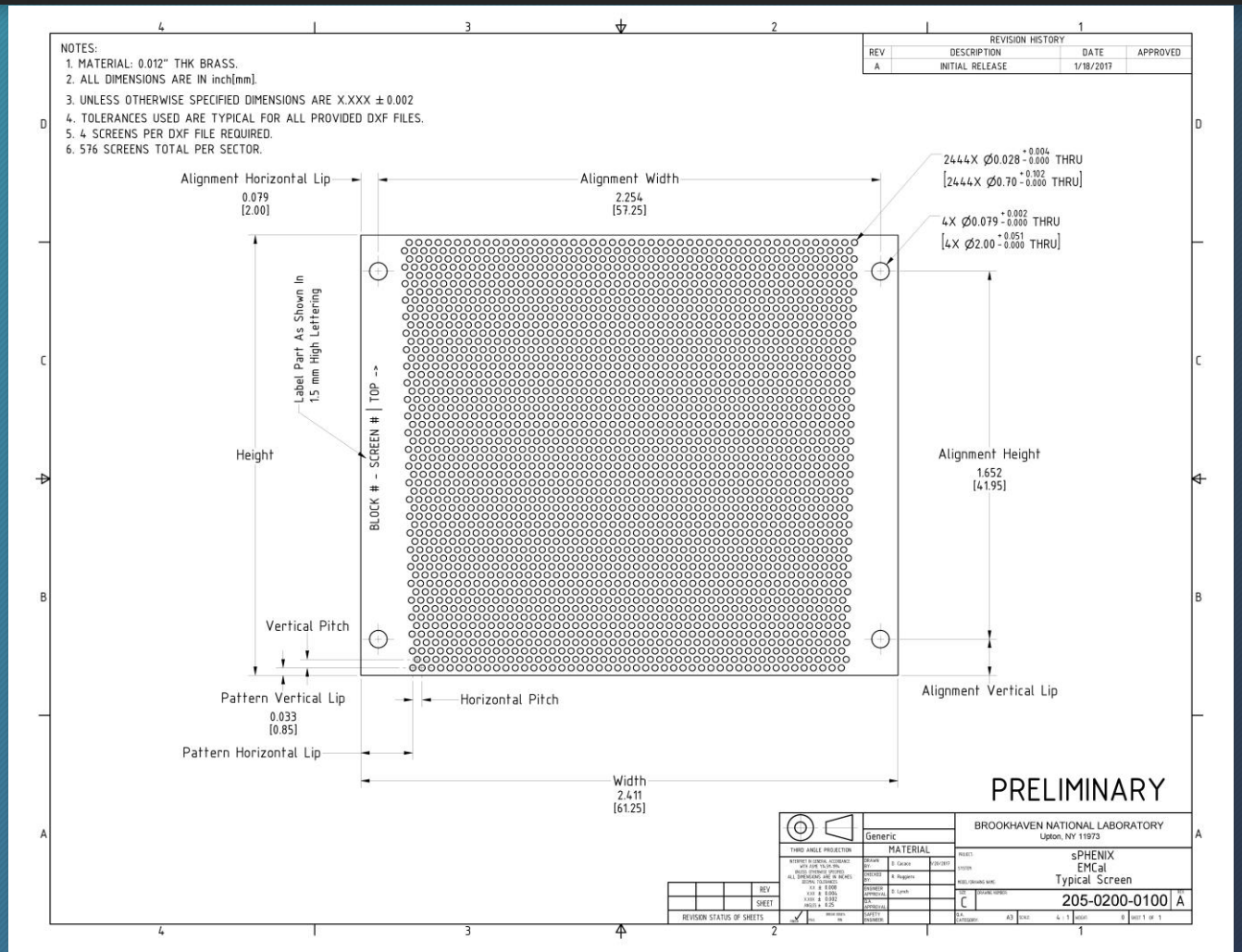
49*56 = 2646 Fibers:
(0.037-0.0.28)-0.008
= 0.001” or 0.0254 mm

50*56 = 2646 Fibers:
(0.036-0.0.28)-0.008
= 0.000”

EMCal Block 24 Drawing

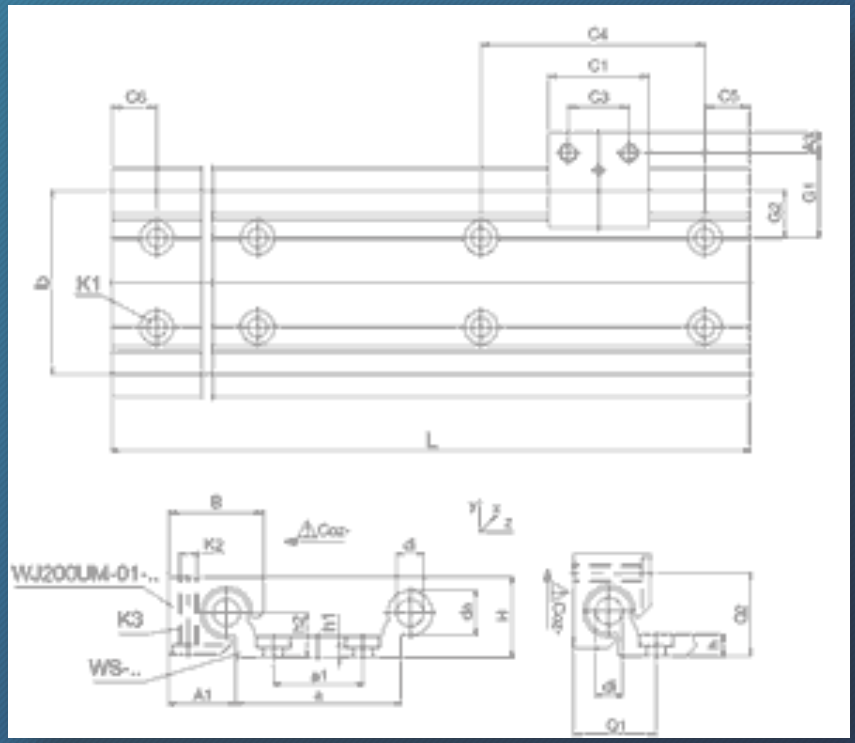


EMCal Typical Screen Drawing



EMCal Aluminum Skin / Box Rails

- One set of rails, aluminum.
- Bearing block, zinc, aluminum or 316 stainless steel.
- Rail width. 6 in (154.4 mm)
- Rail height. 0.7 in (18 mm)



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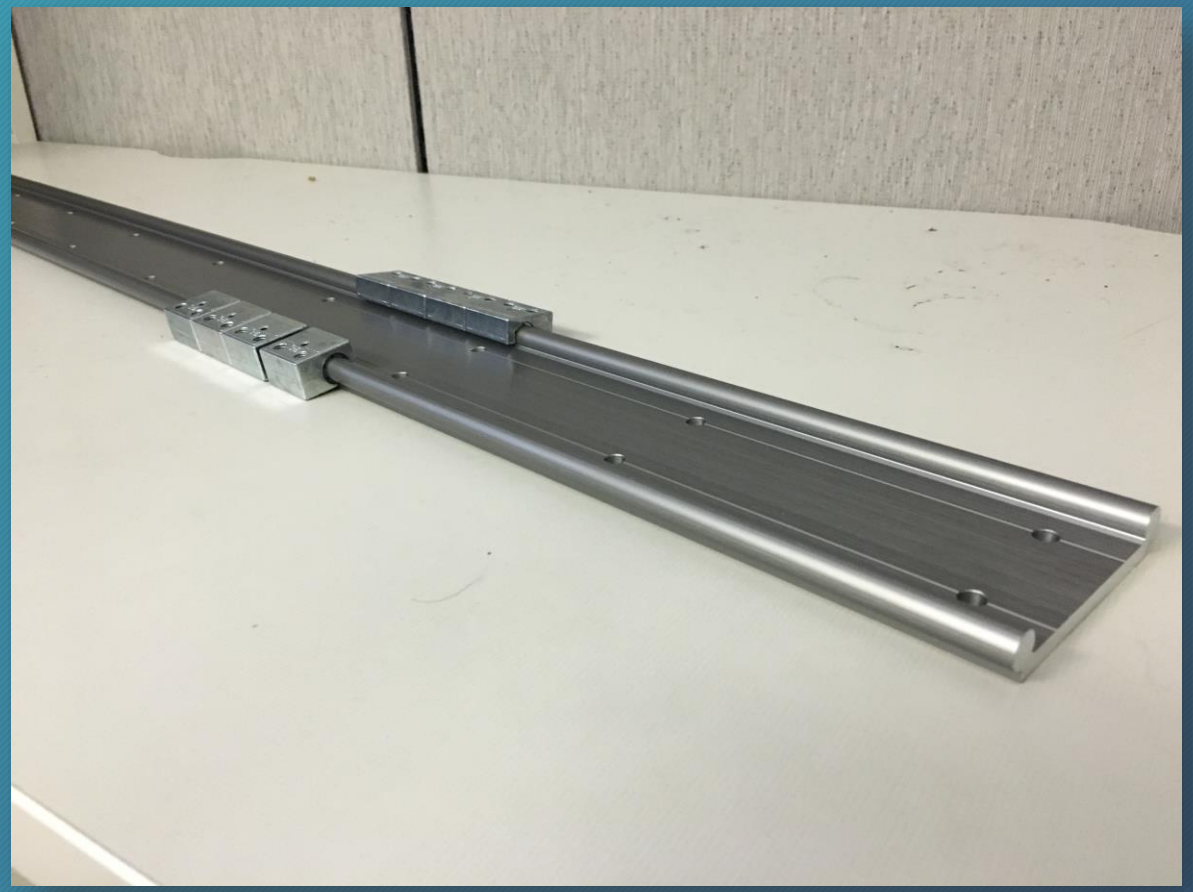
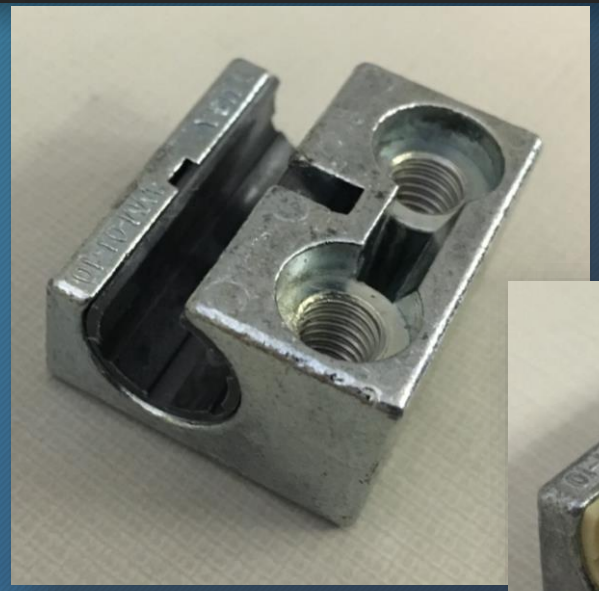
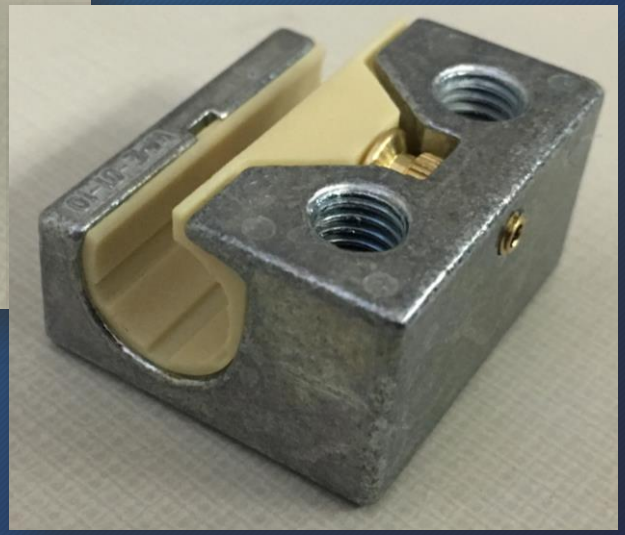
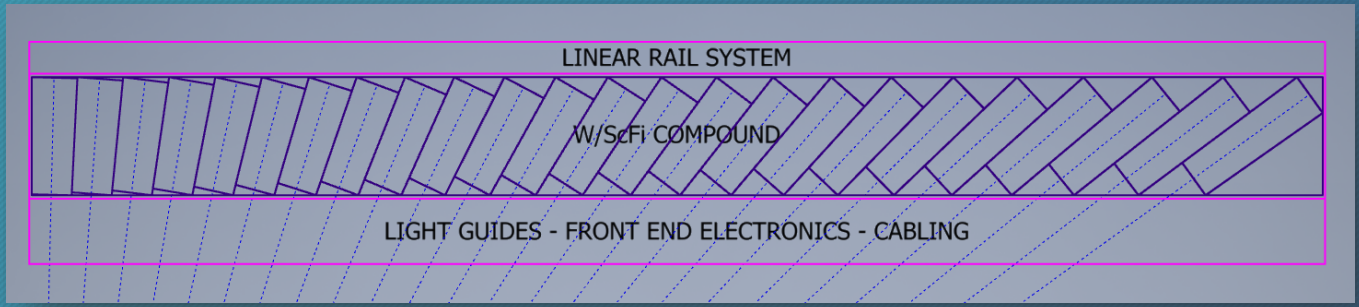
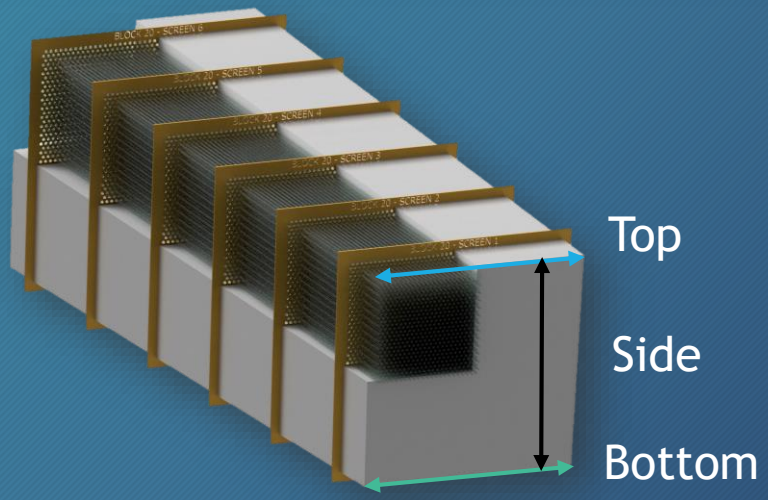


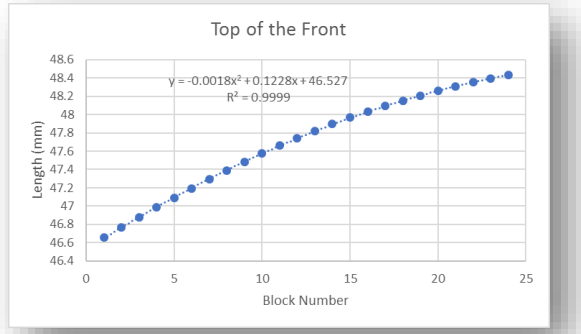


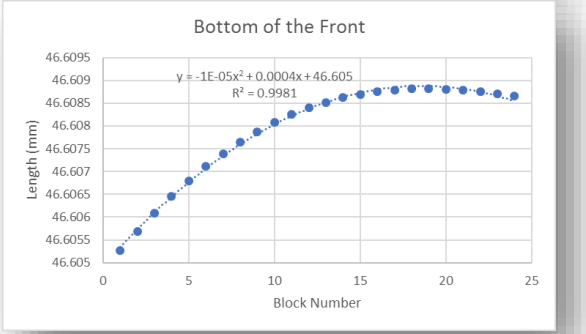


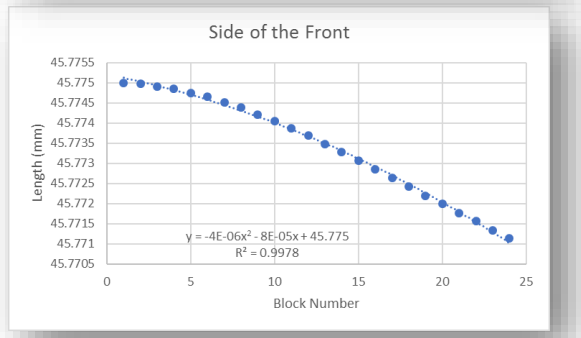
EMCal Dimensions











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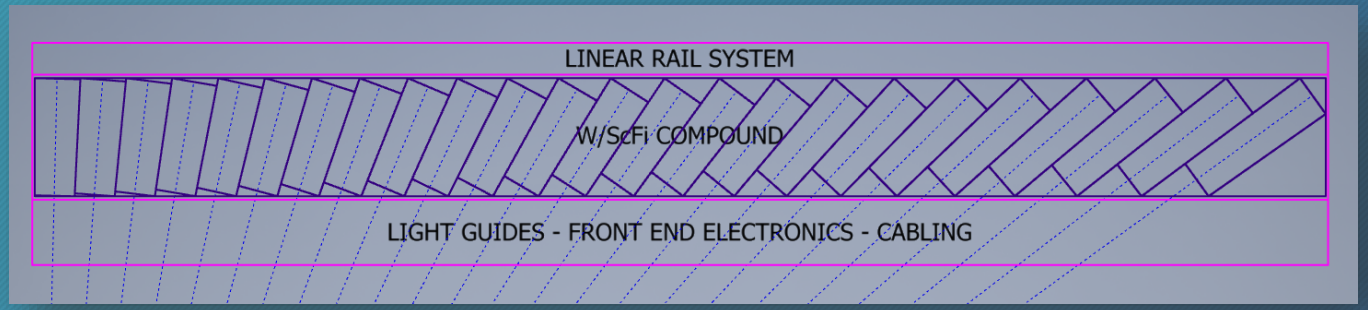
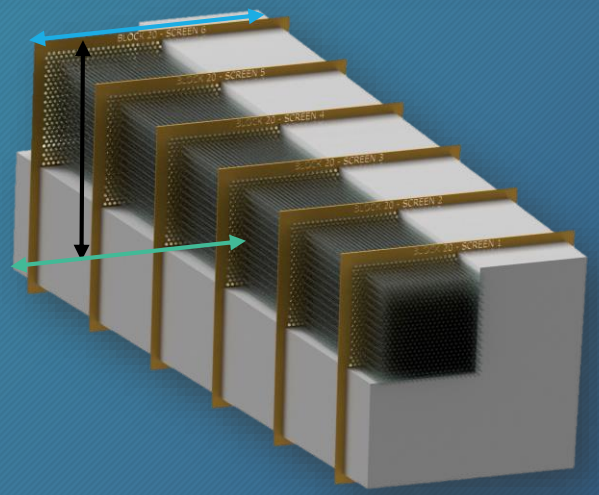
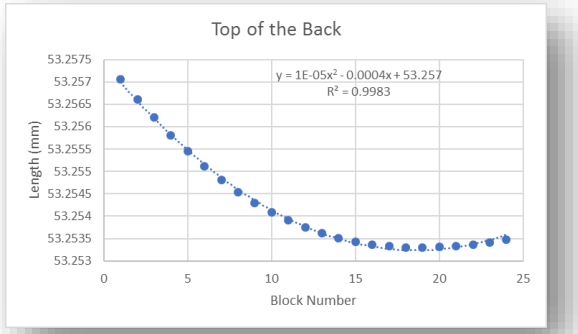


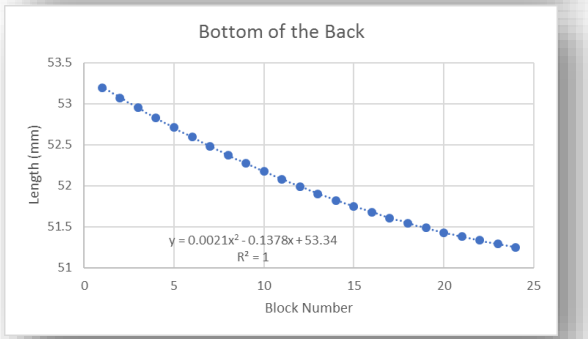
Top

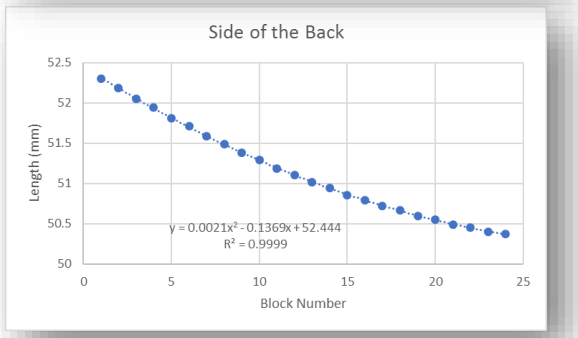
Side

Bottom









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